

What is claimed is:

A1

1. An interconnect comprising:
  2. an anisotropic conductive film; and
  3. an optically transmissive unit embedded in the anisotropic conductive film, the optically transmissive unit providing an optically transmissive path through the anisotropic conductive film.
1. 2. The interconnect of claim 1, wherein the anisotropic conductive film comprises an adhesive, anisotropic conductive film.
1. 2. 3. The interconnect of claim 2, wherein the adhesive, anisotropic conductive film comprises an epoxy and a plurality of conductive particles embedded in the epoxy.
1. 2. 4. The interconnect of claim 3, wherein the optically transmissive unit optically couples each of a plurality of optical transmitters to one or more optical receivers.
1. 2. 5. The interconnect of claim 1, wherein the optically transmissive unit optically couples each of a plurality of optical transmitters to one or more optical receivers.
1. 2. 6. The interconnect of claim 5, wherein the optically transmissive unit has a transmission area that is substantially rectangular.
1. 2. 7. The interconnect of claim 5, wherein the anisotropic conductive film comprises an adhesive, anisotropic conductive film.
1. 2. 8. The interconnect of claim 1, wherein the optically transmissive unit comprises an optical polymer.

1       9. The interconnect of claim 8, wherein the optical polymer comprises an acrylic  
2       acrylate.

1       10. The interconnect of claim 9, wherein the optically transmissive unit comprises a  
2       substantially cylindrical optically transmissive material.

1       11. A method of fabricating an interconnect, the method comprising:  
2              forming one or more holes in an anisotropic conductive film on a carrier substrate;  
3              filling at least one of the one or more holes with a material capable of transmitting  
4       an optical signal; and  
5              laminating the anisotropic conductive film on a packaging substrate.

1       12. The method of claim 11, wherein forming one or more holes in the anisotropic  
2       conductive film comprises:  
3               patterning the anisotropic conductive film to form a patterned anisotropic  
4       conductive film; and  
5              etching the one or more holes in the patterned anisotropic conductive film.

1       13. The method of claim 11, wherein filling at least one of the one or more holes with  
2       a material capable of transmitting an optical signal comprises filling at least one of the  
3       one or more holes with an optical polymer.

1       14. An electronic package comprising:  
2              a first substrate;  
3              a second substrate; and  
4              an interconnect located between the first substrate and the second substrate, the  
5       interconnect comprising:  
6              a conductive film for electrically coupling a first terminal formed on the  
7       first substrate to a second terminal formed on the second substrate; and

8                   one or more optically transmissive units embedded in the conductive film,  
9                   wherein at least one of the one or more optically transmissive units provides an  
10                  optical signal path between an optical element on the first substrate and an optical  
11                  element on the second substrate.

1       15.   The electronic package of claim 14, wherein the conductive film comprises an  
2                  anisotropic conductive film and the first substrate includes one or more terminals and one  
3                  or more devices providing a signal adapted for transmission along the optical signal path.

1       16.   The electronic package of claim 15, wherein the anisotropic conductive film  
2                  contains a plurality of conductive particles which form a conductive path when the  
3                  anisotropic conductive film is compressed between the first terminal and the second  
4                  terminal.

1       17.   The electronic package of claim 16, wherein the first substrate comprises a die.

1       18.   The electronic package of claim 17, wherein the die comprises a processor.

1       19.   The electronic package of claim 16, wherein the second substrate includes one or  
2                  more electrical interconnects and one or more optical paths aligned with the optical  
3                  element.

1       20.   The electronic package of claim 18, wherein the anisotropic conductive film  
2                  comprises an adhesive, anisotropic conductive film.

1       21.   The electronic package of claim 19, wherein the one or more optically  
2                  transmissive units comprises an optical via.

1       22. The electronic package of claim 21, wherein the optical via is formed from an  
2       optical polymer.

1       23. The electronic package of claim 14, wherein at least one of the one or more  
2       optically transmissive units transmits a clock signal.